Mad Hatters and Garimpeiros

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Mercury (quicksilver) and its toxic effects were known to the ancients. The consequences of working with metallic mercury and its compounds date from experiences in the quicksilver mines of the ancient world, where the miners (usually prisoners or slaves) had a working life of about three years. Quite a bit later, an enlightened ruling of 1665 graciously restricted laborers in Adriatic quicksilver mines to workdays of just six hours each.

In the mid-1800's, hat manufacturers began to **use water-soluble mercury nitrate** to soften, compress, and shape animal furs (a process known as felting). The outcome was skin absorption of mercury solution and inhalation of mercury vapor. Clinical signs of mercury poisoning included personality changes and tremors, leading to the English **expression "mad as a hatter,"** and the American term **"Danbury Shakes"** (from the Connecticut town where hatmaking was a chief industry). Although the Hatter is described as "mad" in Lewis Carroll's Alice's Adventures in Wonderland (written in the early 1860's), he appears no more disturbed than any of the other characters, leaving it open to debate whether Carroll was describing a case of mercurialism, or caricaturing a contemporary. In any event, the link between hatmaking and nervous system damage was established by the middle of the 19th century. **It wasn't until 1941, however, that mercury nitrate was banned from hatmaking by 26 states of the United States**.

Today, mercury finds its principal uses in batteries, latex paint (where a mercury compound is used as a fungicide), and in a crude ore-refining technique practiced by the garimpeiros (gold miners) of the Amazon basin of Brazil. In this process, metallic mercury is mixed with river sediment. The mercury combines with the sediment's small gold particles forming a perceptible gold-mercury amalgam. The amalgam is then separated from the sediment and heated in open pans releasing mercury vapor and, of course, leaving behind pure metallic gold. Spilled liquid mercury and mercury vapor returned by way of rain are accountable for several hundred tons of mercury per year accumulating in the Amazon basin. Blood and urine samples from miners and area inhabitants are showing elevated mercury levels.

Recommended Web resources for additional information:

Dangers of Mercury in Fish
Article from Consumer Online, published by the Consumers' Institute of New Zealand.

Does Mercury Make Dentists Mad?
From Natural Life, a magazine devoted to organic gardening, homeschooling, alternative energy.

"Hat Industry" Chapter from Mercury; a History of Quicksilver
Leonard J. Goldwater's study of occupational exposure to mercury. From Duke University Occupational & Environmental Medicine.

How Mercury Poisoning Affected One Dentist

Abstract from 1973 Dent Survey article.

Lewis Carroll: An Overview
From the Victorian Web, Brown University Scholarly Technology Group.

Life or Death? Depends on How You Take a Poison!
A substance's toxicity depends upon its bioavailability. From the Department of Public Health Sciences, University of Alberta.

Mercury Review
Information about toxicity of mercury provided by the Science Teachers' Association of Ontario.

Neuropsychiatric Sequelae of Mercury Poisoning. The Mad Hatter's Disease Revisited
Abstract from a 1995 Br J Psychiatry article concerning a case of inorganic mercury poisoning.

Quicksilver for Gold
Greenpeace International explains how mercury use by the garimpeiros is imperiling the Amazon.

Safe Handling of Mercury
Guidelines from Lawrence Livermore National Laboratory.

Tragic Reminder about Organic Mercury
A 1998 editorial by Ken Kulig from the New England Journal of Medicine.